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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •

July 26, 1941

Smashing Through

See Page 51

A SCIENCE SERVICE PUBLICATION

Do You Know?

Butterwort leaves contain a vegetable rennet that Laplanders find useful in curdling reindeer milk.

Switzerland depends on imports for about one-fourth of its *food*, and is particularly dependent for wheat, sugar, and feed grains.

Industrial accidents last year cost American industry one and one-half billion man-hours of production, or enough labor to build 15,000 bombers.

Many oddly bent and distorted old *trees* are relics of Indian days, when woodland tribes bent and fastened saplings as trail guideposts.

Home builders can help national defense, says the Bureau of Mines, if they will see that houses are properly insulated, thereby saving fuel.

Practising *soil conservation*, Pueblo Indians of the Southwest have for centuries raised corn and vegetables in a land of uncertain and scant rain.

Since *butadiene*, a combustible gas, is used in one process for manufacturing synthetic rubber, the Bureau of Mines has published results of tests to show industry the need for care in its use.

Tourists to Washington are warned against taking home the pretty *water chestnut* in the Potomac to grow at home —the plant which now clogs the Potomac grows fast and wipes out other plants in a stream.

Audubon tried bird *banding* in 1803, marking young phoebes with a silver thread around the leg.

The *horn* of one white rhinoceros killed in South Africa was five feet two and one-fourth inches long.

In dried form prepared for export, 360 *eggs* amount to only about 10 pounds.

Soybean hay is pronounced good for dairy cows, and most of them like it.

About 80% of *grade crossing* accidents involve motorists who live in the neighborhood.

As part of the WPA adult education program in New York, a course in taking shorthand dictation in *medical terminology* is meeting a defense-time need.

QUESTIONS DISCUSSED IN THIS ISSUE

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PUBLIC HEALTH

Expect Victory or Disaster In War on Sleeping Sickness

Stage Appears To Be Set Either For Disease To Flare Into War Epidemic or To Yield To New Knowledge

IS SLEEPING sickness going to be the plague of the present war, as influenza was the plague of the last World War? Or are the nation's disease fighters on the verge of discovering how this dangerous disease is spread and, therefore, how it may be prevented?

Hints that the stage is being set either for disaster or for discovery, though at the moment it is impossible to say which, appear in reports to the *Journal of the American Medical Association,* (July 19) in the *Public Health Reports* of the U. S. Public Health Service (July 4), and in the report to the federal health service of an outbreak of 35 cases of sleeping sickness, 25 of them since July 1, in North Dakota alone.

In the North Dakota outbreak, four of the cases were diagnosed as encephalomyelitis, the medical term for the kind of sleeping sickness that attacks horses and spreads from them to man. Outbreaks of this disease in both horses and men have been reported for a number of years but they usually occur in late summer and fall. The North Dakota outbreak seems to have come a little early and may mean that the nation's total of about 280 cases since the first of the year will go much higher, although 1,217 cases had been reported by August 1 in 1940.

Second danger point in the confusing situation is the finding, just reported from studies of one of last year's outbreaks, that horses not only have their own kind of sleeping sickness which they may pass on to man but are also susceptible to the human sleeping sickness or encephalitis of the type that was epidemic in St. Louis in 1933. This was discovered by Dr. Cornelius B. Philip and Dr. Herald Cox, of the U. S. Public Health Service, Dr. John H. Fountain, of the Weld County, Colo., Health Office, and J. W. Kilpatrick, of the Montana Livestock and Sanitary Board.

Apparently clinching the point that horses may constitute a reservoir of both kinds of encephalitis is the independent discovery of Dr. William McDowell Hammon, of the University of California. He investigated an epidemic of human encephalitis in Yakima valley, Washington, which coincided with a sleeping sickness outbreak among horses, and discovered that some of the patients had St. Louis type of human encephalitis, some had the horse encephalomyelitis, and some had both.

More than one-fifth of the patients in this outbreak died, but some had such mild attacks that without special tests their illness would have been diagnosed as grip or influenza or similar infection of the upper respiratory tract. This suggests that there may be more cases of encephalitis than doctors or health officers know about, a situation with the potential danger of the disease spreading to many patients before it is recognized.

Hope for checking the horse sleeping sickness among both man and horses rests on a vaccine which protects the horses. Even if this could be used on humans and if there were also a vaccine against the St. Louis type encephalitis, laboratory tests would have to be made during an outbreak to determine which vaccine to use and by that time it would probably be too late for a vaccine to check the disease, Dr. Hammon points out.

The sulfa drugs were given to many patients in the Yakima outbreak but there was no evidence that they helped.

The two encephalitis sicknesses are of special concern to military camps, Dr. Hammon points out, because of the ages at which people are generally attacked, the geographic distribution of the diseases, and epidemiologic features. Even a mechanized army has plenty of horses and mules around its camps to serve as reservoir for encephalitis. Present knowledge shows they may have been the source of the encephalitis outbreaks in World War army training camps.

How the encephalitis viruses get from horses to man, or for that matter from horse to horse or man to man, is still an unsolved mystery. Mosquitoes have been suspected but the case against them has so far not been proved. Birds have also been implicated as helping to spread the diseases. If horses are the chief reservoir, it will narrow the search for means of preventing the disease.

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MEDIUM

This is the first M-3 medium 28-ton tank in the United States equipped with regulation armor plate and guns, ready for combat duty. After this demonstration it was delivered to Major General Charles M. Wesson, Chief of Ordnance, U. S. Army, as a gift from the Chrysler Division salesmen, dealers, distributors and their employees. The photograph on the front cover of this week's Science News Letter shows how it can overcome obstacles.

RADIO—AERONAUTICS

Two New Methods of Gaging Altitude of Airplanes

Frequency Modulation Used in One System for Telling Distance From Ground; Low Frequency Used in Other

TWO METHODS of radio distance measurement, enabling pilots of airplanes to tell not only their distance above the ground, but also, in the case of one of the inventions, that from some reference station as well, are included in the patents issued recently by the U. S. Patent Office.

To Dr. Ernst F. W. Alexanderson, General Electric Company engineer, who has made many inventions pertaining to radio and television, was granted patent 2,248,599, which he assigned to his employers.

Frequency modulation, which is making possible static-free broadcasting, is used in this system. However, Dr. Alexanderson describes it as "a new and fundamentally different method" for distance measurement. Very simple apparatus, compared with some of the complicated devices that have been used for a similar purpose, is required.

From the airplane is sent out a high frequency radio signal, which is reflected back from the ground so as to create a series of standing waves below the aircraft. The frequency, or rate of vibration, of the transmitted wave is varied with great rapidity—so fast, in fact, that when the reflected wave has returned to the plane, and is picked up by a receiver, the frequency change has made a complete cycle. The transmitter is then sending out signals of the same frequency as when the wave left—or at least of some definitely related frequency.

The farther away the ground, the longer it takes the reflected wave to return, and the more slowly need the frequency be changed. The receiver picks up both the original wave, which has travelled but a few feet, and the reflected one. If the two frequencies are the same, there is none of the beat frequency between them that would occur if the two were out of step. In use, the control knob of the transmitter is graduated in terms of altitude. It is turned until the beat disappears, and then the height above the ground is indicated.

The other radio distance device won patent 2,248,215 for Horace T. Budenbom, who assigned his rights to the Bell Telephone Laboratories, of New York City. Instead of using a high frequency, or short wave, he uses a low frequency, with a very long wave. The wave, in fact, is somewhat longer than the distance to be measured. By receiving it with two different receivers, each with its own special aerial, it is possible to determine the distance between the transmitter and the receivers, in terms of the length of the wave. The indications are made on a phase indicator, of which various types can be used. This can be calibrated in terms of one or more of the wavelengths used at the transmitter so as to show directly the actual distance.

In a modification of the device, the airplane sends out a signal from a transmitter, to a receiver on the ground. This automatically retransmits it, and it is received back at the plane. Then the apparatus tells the time that was taken. In one form of Mr. Budenbom's invention, the altitude as well as the distance from the ground station are given with the same receiver. Since the ground-reflected wave that tells height comes back much sooner than the retransmitted one for distance measurement, it is possible to separate them by electrical filters, so each is indicated on its own dial.

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A 4,000-year-old *spearhead* used in the Stone Age has been found near Kemi, in northern Finland.

The New York Zoo is exhibiting famous breeds of beef dairy *cattle* in a special exhibit beside the world's wild and primitive cattle.

The *Chinese Dragon* is sometimes explained as having the "nine resemblances": deer horns, camel head, devil eyes, snake neck, sea serpent body, carp scales, hawk claws, tiger paws, and ox ears.

ORDINARY PHOTOGRAPHY

Show this picture and the one on the facing page to a photographer and ask him the difference between them. He will probably tell you that this one was taken with the diaphragm—the adjustable lens opening—opened to the limit. The one on the facing page, he will doubtless tell you, was made with the lens "stopped down," using a very small opening, to focus sharply on the foreground and the distant background in the mirror at the same time. As a matter of fact, both were made at the same lens opening of F. 2.7, with a motion picture camera. This picture was taken in the usual manner. The man in the foreground, 8 feet 6 inches away, is sharp, but the men in the distance, at 48 feet, are blurred.

IR SYSTEM

To take this picture, a new system of lighting control, invented by Dr. Alfred N. Goldsmith, Harry R. Mennefee, William Mayer and Fritz Kastilan, of New York City, was used. Instead of lighting the entire set continuously, first the foreground is illuminated, then the middle distance, and then the background. By means of a series of compensating plates that revolve behind the camera lens, the focus is kept in step with the lighting, so that whichever part is lit is in focus. For each picture of the movie film, the entire set is lighted. The illumination may be divided into four or even more areas if necessary, while in some cases two might suffice. With this system, in the hands of an expert director, it is expected that many dramatic effects can be introduced into the movies.

CHEMISTRY

Mystery Explosive Plant May Be Effort To Avoid Bottleneck

Any Carbon-Containing Compound To Which Extra Atoms Of Nitrogen Can Be Attached May Replace Toluene

THE NAVY'S plans for a $70,000,000 "mystery" plant for producing a new explosive may represent an effort to get away from a bottleneck in production of TNT in the unprecedented quantities that will be necessary when the great fleets of super-bombers now building are ready to receive their loads of deadly "eggs"—some of them weighing as much as two tons each.

Toluene, or toluol, basis of TNT, is normally produced from a light oil distilled out of coal tar. But a ton of tar will yield only about six pounds of toluene—and when toluene is demanded in thousands of tons, a bottleneck can very easily develop.

Recently several new methods have been announced for the production of toluene, or other substances "just as good" for high-explosive manufacture, out of petroleum and natural gas. It is within the field of legitimate conjecture that the proposed new plant described by Rear Admiral W. H. P. Blandy before the House Naval Committee might be for the production and processing of toluene or its equivalent from such fluid fuels.

The exact nature of the explosive is simply impossible to guess. In any case, such guessing might not be in the best interests of national defense. Any carbon-containing compound to which extra atoms (usually three) of nitrogen can be attached is capable of becoming a high explosive. Toluene became the favorite about a generation ago because it is a solid at ordinary temperatures, is easy to handle, and yields a stable, "safe" explosive that doesn't go off until it is told to. But with literally thousands of other carbon-containing compounds available, a wholly new, perhaps more desirable explosive could be worked out and kept safely under wraps of military secrecy until ready for large-scale use.

Science News Letter, July 26, 1941

MEDICINE

Epilepsy and Migraine Are Related Diseases

A GREAT many people, even in this day of free popular discussion of medical topics, illnesses and symptoms, have a prejudice against epilepsy which makes them go far to avoid persons suffering from this disorder and even, perhaps, to hesitate about using the word. These same people, however, are likely to have considerable interest in and sympathy for persons with migraine and the word itself has long had an aristocratic sound. It may surprise such people as well as many migraine and epilepsy sufferers themselves to learn that the two ailments are kin—some sort of cousins, according to Dr. William G. Lennox, of Harvard Medical School. He explains the relationship in his book, *Science and Seizures* (*Reviewed, SNL, this issue*), as follows:

"Epilepsy and migraine are both disorders of the nervous system, but epilepsy involves primarily the brain, and migraine the vegetative (or autonomic) nervous system, that part of the nervous system which is not under the conscious control of the individual. Therefore, if the superficial nature of names is remembered, migraine may be spoken of as an epilepsy of the vegetative nervous system or epilepsy may be called a migraine of the brain."

The same person may have both epilepsy and migraine, as did Julius Caesar. In a study of more than 2,000 patients, more than nine out of every 100 had had attacks of both epilepsy and migraine. Neither epilepsy nor migraine occurred so frequently in 1,000 medical students, nurses and other patients selected for comparison as being representative of the general population. Family histories of patients with epilepsy and migraine also

showed evidence of the relation between the two conditions.

Patients and relatives of patients with either condition will find in Dr. Lennox's book a clear statement of the latest knowledge of causes, diagnosis, prevention and treatment of both conditions.

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ICHTHYOLOGY

New Hall of Fishes Opened at Field Museum

VISITORS to the Field Museum of Natural History will henceforth be able to get a mermaid's-eye view of the sub-sea world in the new Hall of Fishes, just opened to the public. In preparing the new exhibits, museum workers went to the sea bottom in diving bells and submarine tubes, to study and sketch the life of the sea "in place."

Three typical habitants are depicted: a coral reef in the Bahamas, the Gulf bottom off the Texas coast, and a deep tide pool among the rocks of Maine. Special attention has been paid to sharks: specimens range from a "small" whale shark 25 feet long, through the really dangerous man-eating white shark, to bizarre forms like the hammerhead shark and the whip-tail eagle ray.

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PALEONTOLOGY

Half-Billion Years Represented By Three Small Specimens

Cardboard Box Mailed To Each Recipient of "Things" Contains Remnants of Ancient Plant and Animal Life

HALF a billion years of geological antiquity are summed up by three specimens in a little cardboard box, mailed out by Science Service to each of the participants in a new idea in scientific information distribution, called "Things of Science." Instead of words and pictures, actual samples of the materials themselves are circulated. The idea has taken hold especially well in schools, as well as with private persons who want the "Things" for their own collections.

The three specimens in the geological "Things" unit are a brachiopod shell, a fragment of dinosaur bone and a bit of lignitized wood collected near Washington, D. C.

The brachiopod shell in itself accounts for nearly a third of a billion years of earth history. It came from a limestone deposit of upper Devonian age. This was the period when the first air-breathing vertebrates ventured ashore, to found the long line of descent that led to the dinosaurs—and ourselves. Brachiopods are creatures that look rather like clams or scallops, but belong to a different group of animals. The ones now living have changed very little from those of the earliest days—they are among the world's champion conservatives.

Second chunk of antiquity in the little box is the piece of dinosaur bone, perhaps about 150 million years old. This came from a lot of spare parts left over after the assembly of some skeletons of Jurassic age at the American Museum of Natural History. They came from a place in Wyoming called Bone Cabin Quarry, because dinosaur bones are so abundant there that sheep-herders once built a shack out of them, as if they were ordinary field stones. Part of the mineral in this fossil fragment is from the original bone substance, but changed and rearranged by the slow chemistry of the centuries.

Most recent of the specimens is the piece of lignitized wood. This shows the original structure of the old conifer tree that fell into a bog, something over 55 million years ago in Cretaceous time and slowly gave up all its chemical constituents except its carbon and minerals. It looks like a shiny bit of coal, but it is actually crude jet—the same kind of stuff that is used in the familiar beads and ornaments.

Participants receive "Things of Science" monthly, for $4 a year, which permits operation on a non-profit basis.

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BENEATH TEXAS WATERS

This undersea habitat group is in the new Hall of Fishes opened at the Field Museum of Natural History. The photograph shows "oyster lumps"—rounded masses to which the oysters attach themselves to a firm base on the sea bottom and then in turn furnish attachment for other oysters until progressively the oyster lump is formed. Only the outer layer of oysters remains alive.

● RADIO

Thursday, July 31, 2:45 p.m., EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Charles W. Gilmore, paleontologist at the National Museum, will describe expeditions that go hunting dinosaurs.

Listen in each Thursday.

NUTRITION

Price Differential in Favor Of Whole Wheat Bread Urged

Government Subsidy and Extension of School Lunches To Rich and Poor Alike Urged To Raise Nutrition Level

ESTABLISHMENT of a price differential in favor of whole wheat bread through government subsidy supported by a tax on white bread is suggested by Prof. J. Murray Luck, of Stanford University, Calif. (*Science*, July 11.)

Extension of the existing school lunch program so that every child, rich and poor alike, will "receive in the schools one thoroughly good meal every day" is the second part of Prof. Luck's scheme for solving the nation's nutrition problem.

Whole wheat bread is hailed by all nutrition authorities for its high content of certain minerals and of the vitamins of the B group. Enriched bread contains more of these vital food elements than ordinary white bread, but enrichment with pure vitamins, Prof. Luck points out, fails to give the as yet undiscovered vitamins which many scientists believe exist in whole grains.

In spite of being told, day after day, that whole wheat bread is important for health, most people do not eat it for two reasons, Prof. Luck says. One reason is the strongly ingrained preference for white bread. The other is the fact that real whole wheat bread is more expensive than white bread. He cites English experience to show that a combination of lowered price and propaganda increases the consumption of articles of food.

When the price of a banana fell from four cents to two cents, approximately, in England, annual consumption increased from two and one-half million bunches to 20 million bunches. Between 1923 and 1935 the price of grapefruit fell 50% and the annual consumption increased from 1,200 tons to 59,500 tons.

"In the case of whole wheat bread," he points out, "we now have the propaganda but not the favorable price. It may be contended without any reservations that the creation of a sufficient price differential in favor of whole wheat bread would increase its consumption, but determination of the 'sufficient' differential is entirely a matter of trial.

"This program," he declares, "has two real merits: it is capable of immediate execution and it is conducive to the well-being of the low income groups who are now the greatest sufferers from malnutrition."

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NUTRITION

36-Day Supply of Calories Saved by Eating Peeled Wheat

BY eating whole wheat bread instead of white bread you get more proteins for tissue building and more minerals as well as more vitamins, Dr. John R. Murlin, of the University of Rochester, discovered as a result of diet studies with a squad of 10 young men as voluntary subjects. The studies were reported briefly to the National Nutrition Conference in Washington.

"If the peeled wheat bread were consumed by the average man of this diet squad instead of white bread for one year, on the calorie basis he would save enough total energy to supply him for approximately 36 days," Dr. Murlin declared.

Peeled wheat bread is made from wheat prepared by the Earle flotation process which removes only the thin epidermis of the wheat berry constituting not more than 2% of the whole grain.

In addition to the 36-day calorie supply saved in a year of eating the peeled wheat bread, the man "would get 24/100 lb more calcium, 1.1 lb more phosphorus, and one-quarter of an ounce more iron, besides all the vitamins native to the wheat and a significantly higher biological value of the protein," Dr. Murlin stated.

The biological value of the protein indicates the amount digested and actually retained by the body, not merely the amount in the food eaten or even the amount digested, some of which may be lost from the body.

The young men on the diet squad ate a standard diet in which whole egg furnished most of the protein for six days, then ate the same diet with the protein furnished chiefly by a so-called "100% whole wheat bread for six days," then the egg diet for six days, then a diet with the peeled wheat bread, back to the egg diet, and so on. The whole period covered 76 days.

Taking egg protein as 100%, the three whole wheat products had biological values of 77.8% for the so-called 100% whole wheat bread; 79.6% for the peeled wheat bread; 81.6% for the Shredded Wheat Biscuits; and 75.3% for white bread. The differences between the white bread and the two highest whole wheat products were statistically significant. Differences with respect to utilization of starches and fat in the white and whole wheat breads were not significant.

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MEDICINE

Appendicitis Death Rate Reaches Record Low

THE death rate from appendicitis has reached a record low point, after a long and steady rise culminating nearly a decade ago, statisticians of the Metropolitan Life Insurance Company report.

"In 1940," the report states, "the adjusted death rate from this cause was 8.9 per 100,000 (ages 1 to 74 years), the lowest in the experience of the Company, and represented a decline of nearly 40% from the high rate, 14.4 per 100,000 recorded in 1929. Moreover there is every indication the death rate in 1941 will again set a new low record."

Advances in surgical skill and, even more far-reaching, increased public understanding of the symptoms of the disease, of the need for prompt medical and surgical attention, and of the danger of laxatives in case of abdominal pain, are credited with reducing the appendicitis death toll.

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China is said to have had a great *zoological park* for many centuries from 1150 B.C., but it has none today.

ASTRONOMY—RADIO

Communication Black-Out May Come Near End of July

WATCH out for sun-caused trouble with radio and telegraphic communication toward the end of July.

This is the possibility pointed out by astronomers at the Carnegie Institution's Mt. Wilson Observatory based on the fact that the sun revolves every 27 days.

A flare-up in the atmosphere of the sun caused severe magnetic disturbances and interruption to radio circuits on July 4. When the same region of the sun is turned toward the earth about July 29 or a few days later, these disturbances may be repeated. There may then be auroras as well as disturbed radio and telegraphic communication.

These recurrences do not always happen, but astronomers and those in communications will keep an apprehensive watch on the sun.

Because communication is so important in modern war, it is possible that a sudden blacking-out of long distance communication such as caused by such sun disturbances would have important international effects.

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NUTRITION

Vitamin Pills for Soldiers In Northern Climates

UNCLE SAM'S proud boast that the American soldier is the best-fed in the world will be made good under any and all conditions, it appears from a War Department announcement. Each American soldier on duty in far northern climates, it is revealed, will get each day two vitamin tablets along with his daily rations.

Under normal conditions the Army rations contain enough fresh vegetables, fruits, milk and the like to insure an ample supply of vitamins. In far northern climates such as Iceland and Alaska, fresh foods of any sort are scarce and so is sunshine which turns the ergosterol in human skin into vitamin D. The daily vitamin ration is planned to make up for any possible deficiency of vitamins in the food.

The issue tablets will contain the following: vitamin A to protect against bacterial infection, night blindness, dry skin, an eye disease known as xerophthalmia, bladder stones, and infections of the ears, respiratory tract and kidneys; the morale vitamin B_1 to protect against loss of appetite, indigestion, fatigue, and nervous disorders such as neuritis and beriberi; vitamin B_2 or riboflavin to protect against partial blindness caused by opacity of the cornea of the eye and chronic inflammatory skin disorders; vitamin C to protect against scurvy, defective teeth, weakened capillary blood vessels, poor bone knitting, tender joints and infection; vitamin D to protect against inefficient utilization of bone building elements, especially where the supply of calcium and phosphorus is inadequate; and nicotinic acid to protect against pellagra, a skin affection with severe constitutional and nervous symptoms.

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PSYCHOLOGY—MEDICINE

Seek Chemical Antidote To High Altitude Effects

A CHEMICAL antidote against the perils that beset pilots flying at high altitudes is being sought by the psychology department of the College of the City of New York.

The low oxygen content in the air at high altitudes, the freezing temperature, the poor ventilation, noise and boredom frequently cause emotional and muscular disturbances similar to those induced by drunkenness, it is explained. A number of accidents in landing and errors of judgment have been traced directly to the conditions found in high altitude flying.

Oxygen tanks and masks for pilots flying at high altitudes are the measures chiefly relied on at present for protection against the damaging effects of oxygen lack in the upper atmosphere. The City College scientists are going to investigate the stimulating effects of various drugs on persons under conditions similar to those encountered in planes at altitudes up to 12,000 feet, to determine whether any such drug could be used to counteract the effects of high altitude flying on aviators.

The study is being made under the sponsorship of the National Research Council with a grant from the Josiah Macy, Jr., Foundation. In charge of the study are Prof. Gardner Murphy and Dr. Joseph E. Barmack, of City College, and Dr. Eugene Cohen, of the New York Hospital and Cornell University Medical College. Dr. Eugene F. DuBois, of Cornell, chairman of the Aviation Medicine Committee of the National Research Council, is serving as research adviser.

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IN SCIENCE

BOTANY

Blue Nuclei in Flower Petal Cells Explained

BLUE nuclei in flower petal cells, a rare and hitherto puzzling phenomenon, have been very simply explained by Prof. Robert Chambers of New York University. (*American Journal of Botany*, June) They are due simply to an injury of the cell which permits the coloring matter in the cell sap to penetrate into the protoplasm and reach the nucleus, where its hue may be changed due to the higher alkalinity of that part of the cell.

Nuclei of all cells are normally colorless. Blue ones were first observed in tulip petals, in flowers subject to attack by a virus disease. Prof. Chambers produced them artificially simply by slightly crushing strips of petal tissue, while he watched the changes.

Science News Letter, July 26, 1941

AGRICULTURE

Tear Gas in Soil Makes It Safe for Watermelons

TEAR gas (chloropicrin) makes the soil safe for watermelons in parts of the country, especially the South, where the destructive eelworm pest has practically wiped out watermelon culture, U. S. Department of Agriculture scientists have discovered.

Chloropicrin has been known for some time as an effective soil disinfectant, killing some kinds of weed seeds as well as worms, earth-dwelling insects, etc. It has been used by greenhousemen, but its cost places it out of the question for the large masses of soil in outdoor fields.

Key to its usefulness in watermelon fields lies in the slowness of eelworms' migration through the soil. They travel at the very modest rate of an inch a month. Hence, if the spots where watermelon hills are to be located are given a sufficient injection of the tear gas to clean out the area that is going to be occupied by the watermelon roots, the crop can be grown and harvested before the slow-moving eelworms can reoccupy the vacated territory.

Science News Letter, July 26, 1941

E FIELDS

MILITARY SCIENCE

British "Heavies" Carry Less Than Our Light Tanks

BRITISH heavy tanks carry considerably less armament than American tanks classed in the light category, if descriptions reaching this country are correct. According to information received in Washington, the British "heavy," a 25-ton vehicle, carries a two-pounder cannon and one machine gun, mounted side by side in the same turret. The American light tank, weighing only ten tons, carries a similar cannon and four machine guns.

Our new medium tank, weighing three tons more than the British "heavy," has a 75-millimeter cannon in addition to a two-pounder (37-millimeter) anti-tank gun and four machine guns. Two of the latter are of the standard rifle caliber (.30) and the other two are the heavier .50-caliber pieces. This array is by far the heaviest armament carried by any tank in the 25 to 30 ton class.

Commenting on the light armament of the British 25-ton tank, one ordnance officer here suggested that the British authorities may possibly be suppressing information about part of the armament, for reasons of their own.

Science News Letter, July 26, 1941

ARCHAEOLOGY

Oldest Wooden Building In Thick of Mountain War

CHINA'S most venerable wooden building—a Buddhist temple which has stood wars and weather for more than 1,000 years—is in a mountain fighting zone of Shansi province, and fate of the important old building is unknown.

So reports the discoverer of the temple, Dr. Liang Ssu-ch'eng, who was thrilled over his achievement of identifying the extreme age of the wooden building in 1937. His photographs and drawings made on the spot may now be the only records of the building left, though he hopes not, Dr. Liang writes, (*Asia,* July) telling in English of his discovery and its historic significance. Dr. Liang is technical director of the Institute for Research in Chinese Architecture, and for nine years he has investigated ancient monuments in his country.

The Chinese date found on a column in the temple hall corresponds to 857 A.D., which is 127 years earlier than the oldest wooden structure previously found in China.

Of special interest is the discovery that a woman donated the temple. Among giant clay images of deities in the temple was identified the humble life-sized figure of a woman. Monks had assumed this mortal among the gods to be Empress Wu, but Dr. Liang found on the temple beams evidence that she was "Donor of the Hall of Buddha, Woman Disciple Ning Kung-yu."

The ancient wooden building escaped modern fame and recognition because it was on the outskirts of the sacred mountain Wu-t'ai Shan, where fashionable people did not care to go and where the monks were poverty-stricken.

Science News Letter, July 26, 1941

GENERAL SCIENCE

Soviet Scientists Drop Research for Defense Work

PEACETIME research programs have gone by the board in the USSR, as Soviet scientists throw themselves into defense work, Prof. Alexei N. Bach, director of the Biochemical Institute of the Russian Academy of Sciences, states in a radio report received from Moscow.

Two months ago, Prof. Bach relates, a program of new projects in research was laid out. "The work submitted included both practical proposals and a number of outstanding works in the sphere of general, theoretical problems," he says. "Now we are making a fundamental change in the entire character of our work and are placing our scientific research work directly at the service of our country's defense."

Of the task facing the Institute which he directs, Prof. Bach reports:

"The urgent state task facing the Institute during the war is aid to collective farms and state farms to harvest the grain and vegetable crops in time to help the state prevent the grain and potatoes from going bad and thereby to ensure food supplies to our army and peoples. We placed our proposals before the State Defense Committee and are pressing for all Soviet scientists to be called on to work for defense."

Science News Letter, July 26, 1941

MEDICINE

New Emergency Kit For Blitz-Born Babies

A NEW kit for assisting into the world blitz-born babies or those born during other catastrophes such as fire, flood or tornado, has been designed by the Maternity Center Association of New York. The first of such kits has gone to England with the Harvard-American Red Cross Unit for a test under blitz conditions.

The kit is designed to be used where all facilities have been destroyed and the mother must have her baby without even the barest necessities of roof or bed or other furniture at a time when neither water, heat nor light may be available, much less ambulance service to a hospital.

Inside the light fiber board carrying case, such as salesmen use for samples, is packed everything from blankets for mother and baby and sterile obstetrical supplies to a chemical hot water bottle, a tube of bouillon and a comb for the mother. The entire kit weighs 20 pounds, is waterproof, and costs about $20. The two sections of the carrying case when emptied may be turned upside down and placed side by side to serve as a table. The towel in which the sterile supplies are packed provides a sterile cover for this table. After the baby is born, the carrying case becomes his bassinet by fitting one section inside the other. The straps which hold the case together before it is used make it easy to carry baby in his bed to a place of safety.

The first thing the doctor or nurse-midwife finds on opening the case is a set of instructions with clear drawings so that the kit can be easily used even if it has never been seen before. The top article in the kit is a blanket to wrap the mother. Below this are the chemical hot water bottle with directions for its use, a Sterno stove with sauce pan for heating the bouillon for the mother if she needs it, a thermos bottle filled with distilled water, a flashlight, and three packages in paper bags containing: the sterile obstetrical supplies; shirt, binder, diapers, safety pin and flannelette square for the baby; and such miscellaneous items as shaving soap and paper towels for hand washing, silver nitrate ampoules for baby's eyes, vaseline, a nursing bottle with extra nipple, a night-gown and comb for the mother, a pad, rubber sheeting and a teaspoon.

Science News Letter, July 26, 1941

ASTRONOMY

Meet the Stars

In August, It Is Still Warm in the Evening and Sun Sets Early Enough to Let You Get Acquainted with Sky

By JAMES STOKLEY

WHILE it is true that the stars we see in the evening skies of August are not among the most brilliant, as are those we see in the wintertime, they have a beauty of their own. Now that it is still warm, but with the sun setting early enough to bring on darkness considerably sooner than in June, August makes a particularly good month to get acquainted with constellations.

A good place to start is with Vega, in Lyra, the Lyre, which is directly overhead about 10:00 p. m., August 1, and 9:00 p. m., August 15. These are the times for which the maps are prepared, and Vega, brightest star visible in the summer sky, is shown upon them.

Due east from Lyra you find Cygnus, the swan, of which the most conspicuous stars form the "northern cross." Deneb is the bright star at the top of the cross, to the north. And to the southeast from Vega is Altair, most brilliant orb in Aquila, the eagle.

Low in the west is Arcturus, in Bootes, which can be found, if you wish, by following the curve of the handle of the "big dipper." Directly above Arcturus is a semi-circle of stars, Corona Borealis, the northern crown, mythologically the one worn by Ariadne. And between Corona and Lyra is Hercules, famed strong man of Grecian lore. Somewhat inappropriately, perhaps, six of the stars in his group form the outline of a butterfly, heading to the west. And just below Hercules, to the south, is another celestial giant, Ophiuchus, holding the snake, Serpens. Ophiuchus is represented as treading on the scorpion, Scorpius, low in the south, with brilliant and ruddy Antares. This figure can be recognized by the hook-shaped tail of the scorpion, just below the teapot-shaped group of Sagittarius, the archer.

Venus Seen Early

No planets are shown on the maps, but Venus is seen earlier, in the west, shining brighter than any other star or planet, and setting more than an hour after the sun. Later in the evening, as the constellation of Pisces, the fishes, climbs into better view in the east, Mars appears, not quite as bright as Venus, but surpassing any star, and conspicuous by its redness. By midnight Saturn rises into sight, and an hour or so later you can see Jupiter in the east, between Mars and Venus in splendor. Mercury is not visible at all this month.

This coming autumn we are to have an exceptionally interesting display of planets. Venus is slowly brightening, remaining in view later and later in the evening. Mars, on the other hand, is rising earlier, and also increasing in grandeur, as he approaches the earth. In a few months Jupiter and Saturn will also be visible in the evening hours.

The latter two are perhaps most interesting through a telescope. Even a modest-sized one suffices to show the four large moons of Jupiter, revolving around that great planet which is 87,000 miles in diameter. The rings of Saturn can also be seen with such optical aid.

These rings, really a vast swarm of tiny moonlets all traveling around Saturn together, vary in their prominence. Sometimes they are invisible, at other times they can be observed much more easily. This, however, is not due to any actual change in their make-up, but rather to the angle they present to the earth. Though the rings are enormous, about 171,000 miles in outer diameter, the system is extremely thin. Probably the thickness is about 10 miles.

Saturn revolves about the sun once in 29½ years. Since the plane of the rings is slanted to the plane in which the planet encircles the sun, it means that their angle changes.

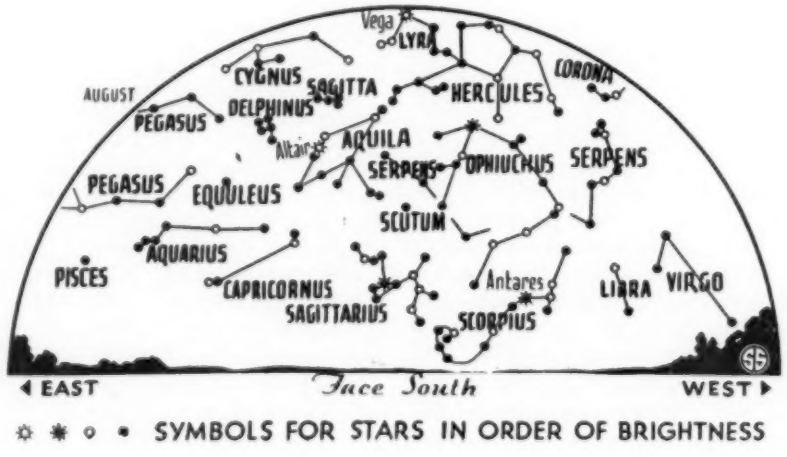
Sometimes, as in the summer of 1936, they are exactly on edge, as seen from earth. Then they are hard to observe with even the biggest telescope. But afterwards they open up, and are seen better and better. It happens that this month, on August 31, they will have opened up to their maximum. On that date the plane of the rings and the line from Saturn to the earth, will make an angle of 24 degrees. During the coming months, though the rings will start to close again, the change will be slight, and during autumn and winter, if you should have a chance to see Saturn through a telescope, you will be able to see the rings nearly at their best. But about five years from now they will again be on edge, and invisible.

Celestial Time Table for August

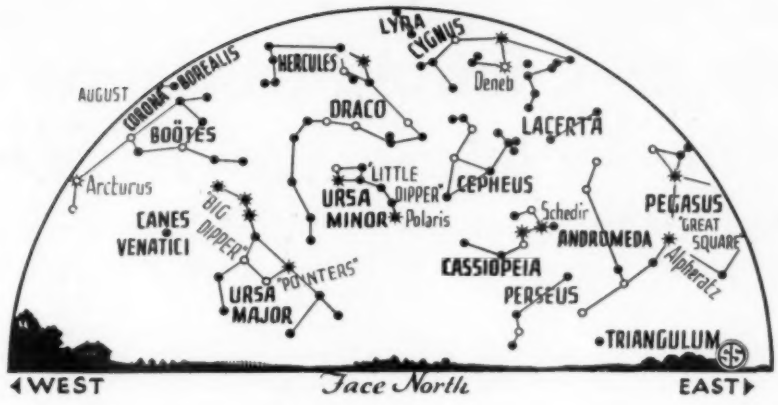
Friday, Aug. 1, 5:00 p. m., Moon nearest, distance 229,400 miles. **Thursday, Aug. 7,** 12:38 a.m., Full moon. **Tuesday, Aug. 12,** 4:53 a.m., Moon passes Venus. Shooting stars of Perseid shower visible. **Thursday, Aug. 14,** 1:00 p. m., Moon farthest distance 251,000 miles; 8:40 p. m., Moon in last quarter. **Friday, Aug. 15,** 7:51 a. m., Moon passes Saturn. **Saturday, Aug. 16,** 10:19 p. m., Moon passes Jupiter. **Friday, Aug. 22,** 1:34 p. m., New moon. **Monday, Aug. 25,** 2:45 a. m., Moon passes Saturn. **Tuesday, Aug. 26,** 8:00 p. m., Moon nearest, distance 228,800 miles. **Friday, Aug. 29,** 9:04 a. m., Moon in first quarter. **Sunday, Aug. 31,** Rings of Saturn at greatest angle from earth.

Eastern standard time throughout.

Science News Letter, July 26, 1941



☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



PUBLIC HEALTH

Physical Rehabilitation of Young Men Declared Vital

Commission Reports That Army Must Lower Standards Or Men Must Be Rebuilt Before or After Induction

THE NATION'S reservoir of young men able to pass Selective Service standards of physical fitness has been drained to the point where: (1) either the Army must lower its present standards, or (2) it must undertake physical rehabilitation of the men after induction or (3) a government-supported program of voluntary rehabilitation must be undertaken, the commission on physical rehabilitation reports. (*Journal, American Medical Association*, July 19.) Newly appointed chairman of the commission is Dr. George Baehr.

The commission "is authoritatively informed that the Army will maintain its present high physical standards of eligibility for military service and will not undertake rehabilitation after induction of men classified by Selective Service and Army induction boards as having remediable physical handicaps."

The commission therefore proposes a plan for voluntary rehabilitation which includes provision for special classification of the men by Selective Service and Army induction board physicians to indicate those having remediable physical handicaps. Registrants so classified are to be told of the condition causing the classification, advised to have it corrected, and given a date for reexamination and reclassification after a time allowance for correction of the defects.

Since it believes only a small proportion of the population will be able or willing to pay for corrective measures to make them available for military or industrial service, the commission recommends Congressional action to defray the cost through federal defense appropriations to the Federal Security Agency.

"Action is required," the Commission declares, "along the lines of one or other of these alternatives (voluntary rehabilitation, Army rehabilitation, lowering of Army standards), for the present standards of physical eligibility have reduced the nation's reservoir of eligible registrants to a number far lower than had been anticipated."

Science News Letter, July 26, 1941

RESOURCES

India, Home of Sandbags, Seeks New Uses for Jute

INDIA, source of millions of sandbags used in air raid defense, is struggling through a jute crisis, in the topsy-turvy confusion of world trade. New uses for jute are being evolved and sought, as a development of the war.

India has shipped 912,000,000 sandbags made of jute for war purposes and has orders for 60,000,000 more, according to reports received at Washington, D. C. The United States continues to receive shipments of this cheap and useful sacking material, imported for gunny sacks, sandbags, camouflage and other purposes. But India's outlets for marketing its annual five billion pound jute crop are so reduced that the crop this year is drastically restricted to about one-third of last year's, and research to find new uses is being pressed.

A cotton-jute fabric with cotton warp and jute weft, produced in India, has proved so promising as material for canvas for hose-pipes, tarpaulins and similar articles that 3,000,000 yards have been shipped to the United Kingdom. Jute fabrics as road building material are being tested.

Scientists in India are being urged to study chemical processes for producing rayon and paper from jute, and also mixed fabrics such as jute-wool, which would be a source of cheap winter clothing for India.

One scientist comments that Germany probably used a good deal of pre-war jute she imported in producing woolenized material. The French army is said to have used some jute-wool uniform cloth. Since Germany has been cut off from jute sources—98% of the crop

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is grown in India—German chemists have invented a new fiber from straw as a substitute.

Realizing that some of the jute substitutes devised as war emergency goods by foreign countries may prove good enough to be permanent, technologists in India are all the more determined to give jute new jobs to do. India can use most of her production, if research is pushed ahead, some technologists believe.

Science News Letter, July 26, 1941

MEDICINE

Bubonic Plague Conquest May Come With Sulfa Drugs

BUBONIC plague, constant danger to life in the Orient and no stranger to the United States even today, is slated as the next conquest of the sulfa drugs. Sulfathiazole, when given with anti-plague serum, saved 98% of plague-infected mice, Dr. Karl F. Meyer, of the University of California, has announced. He believes that the drug alone will prove effective.

One human plague patient has already been treated with sulfathiazole, but did not get the drug until he had been sick with plague for 10 days. Although the drug was given too late to save this patient's life, he survived 30 days, which is at least two weeks longer than would be expected without the drug.

Plague occurs in ground squirrels and wild rodents in this country as far east probably as Nebraska, and causes one human case per year.

Although efforts are still being made to protect humans from this wild rodent plague, Dr. Meyer says he is no longer so worried about the situation, now that sulfathiazole has appeared for treatment of the patients.

Science News Letter, July 26, 1941

BOOKS

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PHYSIOLOGY

Remote-Control Stimulation Of Nerve Moves Leg Muscles

Studies Hold Promise of Throwing Light on Problems Of Crippling Paralysis and Certain Athletic Prowess

MAKING the muscle of a frog's leg contract by remote-control electric stimulation of the nerve has been achieved by Dr. Joseph A. Gengerelli and N. J. Holter, of the University of California at Los Angeles.

Their studies are said to hold promise of shedding light on certain phases of athletic prowess and also on the problems of crippling paralyses.

Electric currents have been used in the past to excite the muscle-moving action of nerves. In those experiments the nerve was put in direct contact with an electric current. But the California researchers have gone farther. In their study the leg muscle and controlling nerve of a frog were put on a glass slide and placed between two 7 x 5 inch condenser plates which were separated by a distance of 2½ inches. The specimen slide touched neither plate. Yet when 2000 volts potential difference was applied to the plates of the condenser, the frog muscle responded by contracting. When the condenser was discharged, the muscle contracted again.

The test was carried farther by placing a drop of water on the frog leg nerve. The muscle failed to respond to the electric "wireless" between the plates. Apparently, said Dr. Gengerelli, the water acted as a shield like the metal which covers the wires leading from receiver to antenna in an automobile radio.

Science News Letter, July 26, 1941

PALEONTOLOGY

Crocodile Stomach Stones Travel Safely Through War

Stanford Geologist Wanted Them From Africa For Comparison With Stones From Stomachs of Dinosaurs

THROUGH Britain's war zones in Egypt there have come to the Stanford University geology museum two pounds of stomach stones from Uganda crocodiles. "Crocs" fill their stomachs with stones just as chickens fill their gizzards with pebbles.

Prof. Bailey Willis, veteran Stanford geologist, is telling the story of how scientific colleagues in Africa, in spite of the war, sent him by His Majesty's post bits of rock that crocodiles swallow and retain in their interior anatomy.

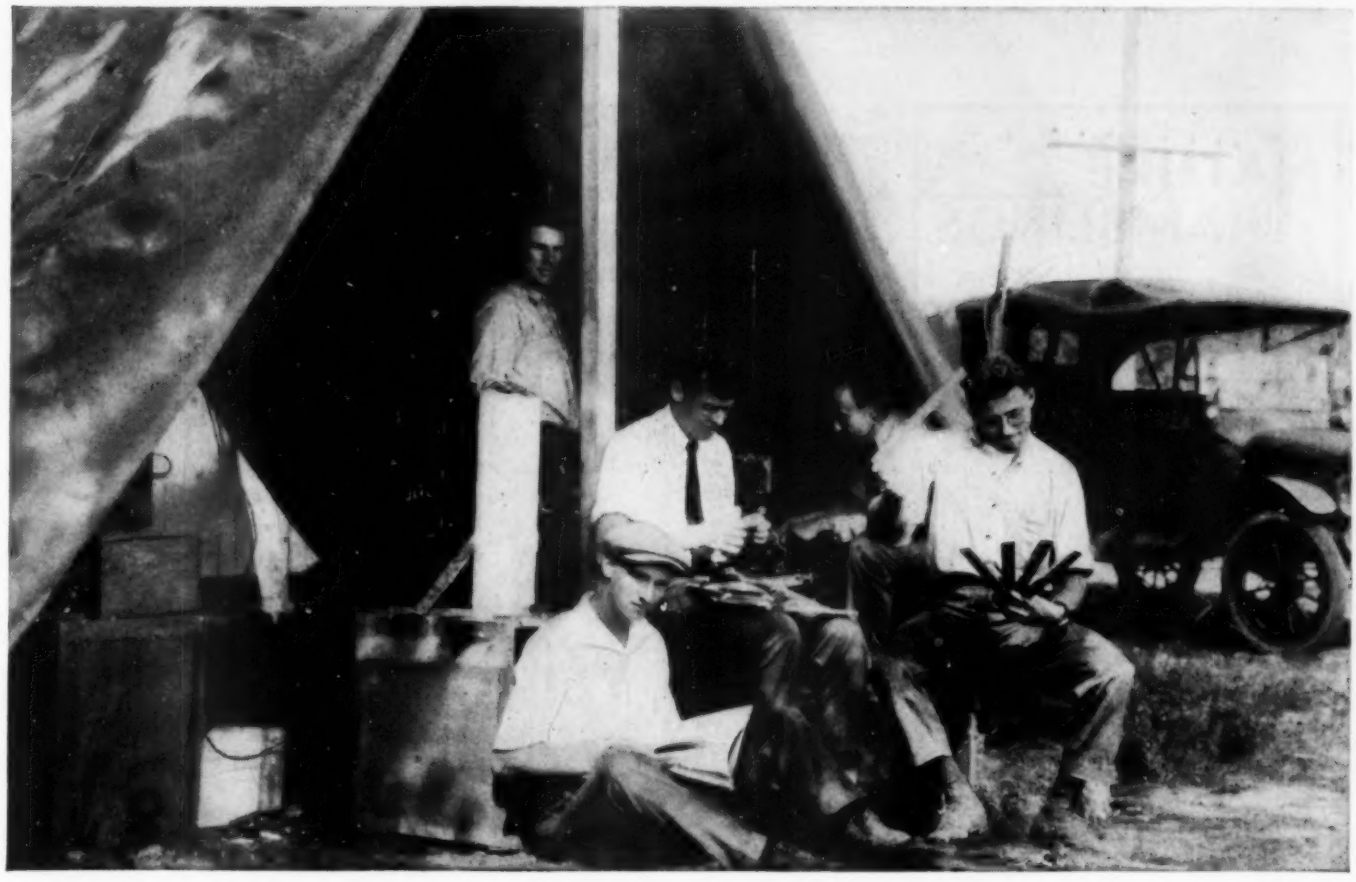
These crocodile stomach stones are exhibited beside stones from the stomachs of dinosaurs that lived 60,000,000 years ago. The dinosaur stones are washed out from among the bones of the giant extinct reptiles unearthed in our western states. Prof. Willis had the dinosaur stomach stone collection and he wanted to compare them with similar stones from crocodiles that he had heard about during his African travels. So he wrote to scientific friends in Uganda.

The reply was that no crocodile stomach stones were immediately available because crocodiles were getting scarce in Africa and game laws protected them. But the game warden, who could legally make such a collection, promised to send the eminent American professor the specimens he wanted as soon as possible.

All this was before the war. When hostilities began and shipping was interrupted, Prof. Willis gave up hope of getting his cherished crocodile stomach stones.

He was agreeably surprised when nearly two years later the postman delivered a parcel post packet, passed by the censor, bearing marks of having come down the Nile through Egypt and via besieged Great Britain.

Science News Letter, July 26, 1941



It all started in a tent...

AGAINST the horizon of "the spires of Princeton," the world's largest radio research laboratories are to be built by the Radio Corporation of America at Princeton, New Jersey.

The new RCA Laboratories, to be completed before the year-end, are planned to promote the growth of radio as an art and industry, and to meet the expanding demands of national defense. Several hundred research experts and engineers will coordinate their efforts to create new products and services, and improve existing ones, in all fields of radio and electronics.

The march of progress which has led to Princeton started back in 1919 when the first RCA laboratory was located in a tent, later to be augmented by a shack 15 feet square at Riverhead, L. I. From that humble beginning, with public service as the watchword, RCA has pioneered in radio manufacturing, international communications, marine radio, broadcasting, sound reproduction and television. Through continuous research it has discovered keys that have unlocked new doors of radio science, and has extended the usefulness of radio into many realms of public service.

Now, RCA research experts on a united front at Princeton are to take another historic step to enhance America's preeminence in radio, and to increase the services of radio to the Government, to the people of the United States and to industry.

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METEOROLOGY—ECOLOGY

NATURE RAMBLINGS
by Frank Thone

Inches of Rain

MEASURING precipitation in terms of depth to which it would fill a straight-sided can or crock can be recommended for its convenience, but not for very much else. Even in its own terms, the record may falsify itself, because frequently the water that falls in a shower may evaporate and then be immediately re-precipitated as another shower in practically the same place. Thus the same inch of rain may be recorded on the rain-gauge as two or three inches.

In terms of water actually supplied to growing vegetation, measurement in terms of simple depth means even less. Of any given shower, a part may run off as surface drainage, part seep down through the ground into subterranean drainage, and at least a minor fraction will be intercepted by the foliage of the plants themselves and immediately evaporated back into the air. There is also a good deal of evaporation from the moist surface of the earth. Since all these fractions are highly variable, there is no possible formula for calculating the remainder that is retained by the soil at root-tip level.

The only way to gauge the amount of moisture actually available for plant growth would seem to be to dig down to the level of the absorbing roots and find out how much water is there. But even then, difficulties of measurement are not ended. Calculation in terms of percentage by weight means little, unless the character of the soil is taken into account. A coarse, sandy soil containing 10% of its weight in water may be wet, even saturated, while a fine-grained clay or loam with the same moisture percentage would be desert-dry, so far as availability for plant needs is concerned.

The most practical method of measuring actually available soil moisture would seem to be to devise some kind of absorbing instrument to be placed in root-like contact with the soil at root level, and let it operate more or less as roots operate. The amount of water it could absorb under such conditions might then be taken as an approximation of the water-supplying power of the soil at the moment. As a matter of fact, a number of such soil-moisture-measuring instruments have been devised. Some of them are moderately successful but none of them entirely so. This is a problem so complex and difficult that scientists will have to work on it a good many years before they find a really satisfactory solution.

Science News Letter, July 26, 1941

METALLURGY

X-Rays With Microscope Reveal Hidden Flaws in Metals

A NEW method of studying metals, with the microscope and X-ray in combination, that may yield useful information in connection with their use in guns, airplanes, engines and other defense needs, was described by Dr. George L. Clark of the University of Illinois, and Dr. William M. Shafer, of Iowa State Teachers College to the American Society of Metals meeting in Cleveland.

Though X-rays are similar in nature to light waves, their waves are much shorter, and they cannot be bent by lenses the way light can. Thus, no one has yet found a way to focus them, which would be necessary to magnify X-ray images directly.

Instead, the method used is to take an X-ray picture the same size of a thin sliver of the metal being tested. Then, with light, a magnified photograph of the tiny X-ray negative is taken through a microscope. To get best results, it is essential to use a film with extremely small grains, otherwise they would be magnified as well, and would mask details being studied in the metal. By using a special emulsion imported from Belgium, Drs. Clark and Shafer have found it possible to magnify the finished result as much as 200 diameters, without losing detail.

Ordinary photographs of metallic specimens through the microscope are made of the surface, by light reflected from it. With the X-ray methods, it is pointed out, a three-dimensional view is obtained since the X-rays pass through the specimen. This shows better the internal irregularities of structure. Cracks and voids inside the piece are revealed. With the ordinary microscopic picture, the specimen must be carefully prepared and polished, but this is not necessary with the X-ray method.

Also, in some cases, it is stated, the usual treatment does not differentiate between different materials in the metal, but whenever the two materials have a different density, they are shown up by the X-rays.

Science News Letter, July 26, 1941

The first *highway* across the Isthmus of Panama at the Canal Zone is scheduled to be finished by next spring.

Brown University is having thousands of books and documents on early Latin-American civilization copied on *microfilm* from archives in Latin-American libraries.

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Additional Reviews On Page 64

BIOLOGY

BIOLOGY OF THE LABORATORY MOUSE—The Staff of the Roscoe B. Jackson Memorial Laboratory; Clarence C. Little, director, George D. Snell, editor—*Blakiston*, 497 p., illus., $7. From nowhere better than the Jackson Laboratory could have come a complete and authoritative treatise on the laboratory mouse, for that place can properly claim status as Mouse Headquarters for the world. The book begins at the smallest beginnings, with a chapter on The Early Embryology of the Mouse, and pursues its subject through Histology, Neoplasms, Genetics, and so on to the parasites and infectious diseases that give murologists some of their worst troubles.

Science News Letter, July 26, 1941

PHARMACY—BIOGRAPHY

CORNER DRUGGIST—Robert B. Nixon, Jr.—*Prentice-Hall*, 291 p., $2.50.This is the biography of a member of a vanishing tribe, the corner druggists. The special characteristics of this particular one perhaps made his life more interesting and colorful than the average, but many of the incidents and the general atmosphere are doubtless typical.

Science News Letter, July 26, 1941

MEDICINE

MEDICINE AND HUMAN WELFARE—Henry E. Sigerist—*Yale Univ. Press*, 148 p., illus., $2.50. The development of medicine and public health is discussed from historical and sociological angles in this interesting and thought-provoking book.

Science News Letter, July 26, 1941

PALEOBOTANY

PALEOECOLOGY OF TWO PEAT DEPOSITS ON THE OREGON COAST—Henry P. Hansen—*Oregon State College*, 31 p., 50c.

Science News Letter, July 26, 1941

HOROLOGY

WATCHES, Adjustment and Repair—F. J. Camm—*Chemical Pub. Co.*, 166 p., illus., $2.50. A concise and up-to-date book on modern methods of repairing, adjusting and timing watches, including such recent developments as electric watch rate recorders like that developed by the Western Electric Co. Of British origin.

Science News Letter, July 26, 1941

ELECTRICAL ENGINEERING

WIRING CIRCUITS FOR LIGHTING, POWER AND INDUSTRIAL CONTROL—J. R. Stuart—*Chemical Pub. Co.*, 208 p., illus., $2.50. Volume 5 in the "Electrical Engineer" series, issued in England, this handy work deals with such methods of control as the photocell, motor starting, flashing and dimming of lights, etc.

Science News Letter, July 26, 1941

AERONAUTICS

INTRODUCTION TO AVIATION—James P. Eames—*Chemical Pub. Co.*, 196 p., illus., $3.50. Although no one can learn to fly an airplane merely by studying a book, the embryo pilot has a definite advantage if he is already familiar with the principles that he will encounter. Such a book as this will do much to give him that familiarity.

Science News Letter, July 26, 1941

ELECTROCHEMISTRY

ELECTRO-PLATING AND ANODISING—J. Rosslyn—*Chemical Pub. Co.*, 224 p., illus., $2.50. As volume 12 in the English "Electrical Engineering" series, this book is a concise account of the principles and methods of electrical deposition of metal films, not only for ornamental purposes, but also for the formation of a protective coating in industrial applications.

Science News Letter, July 26, 1941

TECHNOLOGY

CHEMISTRY OF PULP AND PAPER MAKING (3d ed.)—Edwin Sutermeister—*Wiley*, 529 p., $6.50. Though the first two editions (1920 and 1929) of this authoritative work were entirely by Mr. Sutermeister, in this new one he has obtained the collaboration of a number of experts to write chapters regarding their special fields, because "it was felt that no one person could do justice to all the subjects which it was desired to include."

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ARCHAEOLOGY—BOTANY

TREE-RING ANALYSIS AND DATING IN THE MISSISSIPPI DRAINAGE—Florence Hawley—*Univ. of Chicago Press*, 110 p., 7 pl., $1.50. A pioneer study of tree rings in a large area of the Middle West, with a view to dating types of culture, and migrations and other events occurring when Mound Builder Indians occupied the region. The annual growth rings of trees now carry weather records in this area back to 1318 A.D., in addition to dating Indian remains.

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Improved Bibliofilm Service for Research

The Library of the U. S. Department of Agriculture and the American Documentation Institute announce an important improvement in the service of scientific literature for research purposes.

Bibliofilm Service, formerly operated by the American Documentation Institute under cooperative agreement with the United States Department of Agriculture, is being operated by the United States Department of Agriculture. The American Documentation Institute is continuing to cooperate by loan of equipment and joining in facilitating maximum service.

Important simplifications in service inaugurated include:

A flat price of 50 cents is established for any size periodical article.

Arrangements are being made to facilitate copying of material, wherever it may be found, by transferring orders.

Due to the flat price established, remittance with each order is practical, eliminating troublesome bookkeeping transactions.

New Price Scales

The rate for microfilm copying of any single article, regardless of its length, from any single volume of a periodical publication, will be a flat charge of 50 cents on the basis of cash-with-order.

The rate for copying from books will be 50 cents for each 50 pages or fraction thereof.

Photostats will be furnished at a charge of 20 cents a print, with a minimum charge of 50 cents per item.

All charges, except for state and federal agencies, are on the basis of cash-with-order.

Payments may be made by cash or by check drawn to the Treasurer of the United States.

The American Documentation Institute is enabled by this arrangement to give major attention to the important function of auxiliary publication through microfilm, sets of journals in microfilm, and other activities of service to the scientific and scholarly world.

The American Documentation Institute is refunding Bibliofilm Service deposit accounts as of August 1.

Orders for microfilm or photostat copies of materials in the Department of Agriculture Library should be addressed to U. S. Department of Agriculture Library, Washington, D. C.

Correspondence relating to auxiliary publication, sets of journals, etc. should be addressed to the American Documentation Institute, Science Service Building, 1719 N St., N. W., Washington, D. C.

AMERICAN DOCUMENTATION INSTITUTE
Watson Davis, President

U. S. DEPARTMENT OF AGRICULTURE LIBRARY
Ralph R. Shaw, Department Librarian

•First Glances at New Books

Additional Reviews On Page 63

MEDICINE—AERONAUTICS

FIT TO FLY, A Medical Handbook for Fliers—Malcolm C. Grow and Harry G. Armstrong—*Appleton-Century*, 387 p., $2.50. Men, fit for flying, are just as essential in aerial warfare as the planes that carry them along. The Army Air Corps top flight surgeons have written in simple but accurate language a guide to health for aviators, that will be valuable to fledgling and veteran pilot alike.

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MEDICINE

TOBACCO AND HEALTH, Some Facts About Smoking (2d ed.)—Arthur H. Steinhaus and Florence M. Grunderman—*Association Press*, 48 p., 35c.

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MEDICINE

DIET IN SINUS INFECTIONS AND COLDS (2d ed.)—Egon V. Ullmann—*Macmillan*, 185 p., $2.

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MEDICINE

HELP YOUR DOCTOR TO HELP YOU WHEN YOU HAVE: Food Allergy, 50 p.; Gastric or Duodenal Ulcer, 53 p.; Sick Headache or Migraine, 37 p.; Colitis, 30 p.; Gallstones and Disease of the Gallbladder, 31 p.—Walter C. Alvarez, ed.—*Harper*, 95c each. A useful series of simply written books intended to supplement but not to replace the advice of the patient's physician. Many a busy practitioner who cannot always answer all the patient's questions about his ailment will find that these books answer the questions for him.

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EDUCATION—MEDICINE

YOUR CAREER IN NURSING—Cecilia L. Schulz—*Whittlesey House*, 205 p., $2. This book is especially timely because the national defense demand for more nurses has undoubtedly turned many a young girl's thoughts to nursing as a career. This book tells, in a snappy style that will be appreciated by the modern Miss, what it takes to become a registered nurse.

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HISTORY

THE LURE OF GOLD—William B. Goodwin—*Meador Pub. Co.*, 215 p., illus., $2. The story of the five lost ships of Christopher Columbus is the narrative thread of this book. The author quotes many references to bring out clues as to the fate of these ships. Chapters on the appearance of Columbus and the whereabouts of his remains are also included.

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MEDICINE

SCIENCE AND SEIZURES, New Light on Epilepsy and Migraine—William Gordon Lennox—*Harper*, 258 p., $2. See page 53.

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MATHEMATICS

FIRST YEAR OF COLLEGE MATHEMATICS—Henry J. Miles—*Wiley*, 607 p., $3. This text, the author points out, is not intended for a survey course, nor to give merely a smattering of various branches of mathematics. Algebra, plane trigonometry, plane and solid analytic geometry and the beginnings of calculus are included, with their interrelations kept constantly before the student.

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PHYSIOLOGY

BIOLOGICAL SYMPOSIA—Jaques Cattell, ed.; Vol. III, MUSCLE—Wallace O. Fenn, ed.—*Jaques Cattell Press*, 370 p., $3.50. Intended as a "source book of modern information on this complicated subject" for teachers and investigators. The scope of the book had to be limited because of difficulty in obtaining manuscripts from European investigators, but it will doubtless be of considerable interest and usefulness nevertheless.

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MEDICINE

DISEASES OF THE DIGESTIVE SYSTEM AND FOOD ALLERGY—Josef S. Smul—*Medical Library Co.*, 219 p., $3.50. Fellow physicians may be interested in the author's original views on the subject.

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PUBLIC HEALTH—HYGIENE

PUBLIC HEALTH AND HYGIENE, A Students' Manual (3d ed.)—Charles Frederick Bolduan and Nils William Bolduan—*Saunders*, 366 p., $3.

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MEDICINE

OBESITY AND LEANNESS—Hugo R. Rony—*Lea & Febiger*, 300 p., illus., $3.75. A technical book for general medical practitioners. Said to be the first comprehensive presentation of the subject since 1900.

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MEDICINE—HEALTH

TOUGHEN UP, AMERICA!—Victor G. Heiser—*Whittlesey House*, 228 p., $2. Health advice, facts and anecdotes are pleasantly blended in this book which is written in an authoritative manner bound to prove comforting to many readers. In fact, Dr. Heiser writes with such persuasiveness that many a reader of this book will doubtless start doing the recommended setting-up exercises even though he considers them as boring as Dr. Heiser confesses he finds them.

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TRAVEL—ZOOLOGY

ELECTRIC EEL CALLING—Shelby Shackelford—*Scribner's*, 258 p., illus. by author, $3. This is more than another travel book, more than a popular treatise on tropical natural history. The artist wife of a scientist who has traveled to Brazil to study the physics of the electric eel finds time, between spells of assisting him, to take long, penetrating and sympathetic looks at the human scene.

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SPORT

LUCK IN ALL WEATHERS, Personal Adventures in Hunting and Fishing—Donal Hamilton Haines—*Farrar & Rinehart*, 285 p., $2.50. An experienced sportsman gives sound advice to his fellows, with illustrations from his own experience. Whether your weapon is gun or rod, you'll find this book appetizing reading.

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RECREATION

TIME ON THEIR HANDS, A Report on Leisure, Recreation, and Young People—C. Gilbert Wrenn and D. L. Harley—*Amer. Council on Education*, 266 p., $2. A comprehensive round-up of the recreation needs of youth in our country, and what governmental and private agencies are doing to meet the needs. It presents facts and ideas which should be helpful to workers in this field and additional reading suggestions at the close of each chapter.

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ORNITHOLOGY

SPECIATION IN THE AVIAN GENUS JUNCO—Alden H. Miller—*Univ. of Calif. Press*, 261 p., $3. A monograph of interest to systematic ornithologists and to taxonomists generally.

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